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USING SOCIAL-GEOGRAPHIC WEB PLATFORMS TO ENHANCE DESIGN LEARNING

Design Studio 2.0 in Luxembourg

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Abstract. In this paper, we discuss the opportunities and challenges of using a web 2.0-based social-geographic platform to enhance design learning. We base our arguments on our recent findings from an experimental urban design studio and reveal our observations relating to the nature of learning that took place in it. In brief, the web platform enabled us to extend the learning that took place in the design studio beyond the studio hours, to represent the design information in novel ways and allocate multiple communication forms. We found that the students' activity in the introduced web platform was related to their progress. Moreover, the students perceived the platform as a convenient medium and addressed it as a valuable resource for learning.

Keywords. Design Studio 2.0, Collective Mapping, Design Learning, Web 2.0, Social Media.

1. Introduction

During the last decade, the convergence of Web 2.0-based social media and geographic technologies resulted in the development of novel knowledge production tools and strategies which facilitate social and location-aware learning (Lund, 2012).

Today, these media and technologies have a lot of potential for enhancing and augmenting learning; specifically design learning. From a constructivist point of view, learning that takes place in the architectural design studio is a type of social knowledge building through rigorous dialogue and reflection-in-action (Schön, 1987). In this sense, web-based social media and geographic technologies provide opportunities to facilitate learning through discussion and informed consensus on actions as well as on various design problems (Ham and Schnabel, 2011). Students who are connected via net-

works, interacting and sharing things, can possibly lead to a form of (collective) intelligence that is universally distributed and coordinated in real time (Rheingold, 2002).

Motivated by the above, this study should be conceived as a continuation of a series of our "Design Studio 2.0" experiments which involve the exploitation of opportunities provided by novel socio-geographic information and communication technologies for the improvement of the design learning processes (Pak and Verbeke, 2012).

In this context, we will start our study by a brief discussion on the Design Studio 2.0 concept in relation to a conventional design studio setup (Section 2). Following this section, we are going to reveal the results of our design studio experiment, which took place during the Spring Semester of 2012 in Luxembourg (Sections 3 and 4). This will be followed by the conclusion through which we will summarize our findings and make recommendations for the future studies (Section 5).

2. Potentials of the Design Studio 2.0 compared with a Conventional Design Studio

Design Studio 2.0 (DS 2.0) is a concept describing an educational setting in which the dialogue between the students, teaching staff and other potential third parties is mediated by the use of Web 2.0-based social software and information aggregation services; supporting, augmenting and enriching the reflective learning processes (Pak and Verbeke, 2012).

In contrast with the conventional design studio, DS 2.0 promotes “community building” and “social learning” rather than one-on-one and face-to-face communication. While the design students are disconnected from the physical studio environment, they can still learn from and comment on each others’ projects and create a collective understanding of the design problem(s), the design context and the whole studio process. In addition, the course materials and various design products that are created during the design studio can be documented in a structured manner and transferred to concurrent and future design studios, designers and design researchers in various geographies. However, it is important to note that the focus of the DS 2.0 is not solely on the documentation and structuring of design information, but also on the collective construction of understanding and knowledge.

DS 2.0 differs from the conventional design studio in terms of available communication modes and styles, learning experiences, studio focus, studio environment, time, information resources and representation of design in-

formation. It offers numerous opportunities which are not fully or easily available in a conventional design studio setting.

The potentials of DS 2.0 have been partially demonstrated by various practical implementations. Burrow and Burry (2006) reported the effective use of Wikis as an internationally distributed design research network incorporating diverse forms of expertise and focusing on the extension of the Sagrada Familia Church in Barcelona. Chase et al. (2008) introduced the "Wikitecture" concept as a decentralized method of open source co-production and tested the use of a three dimensional Wiki to collaboratively develop a design competition entry. Following a similar track, the OIKODOMOS Project (Madrazo et. al, 2013) developed a blended learning pedagogy by incorporating a web-based learning space in which teachers and students of schools of architecture and urban planning collaborated in the design and implementation of learning activities dedicated to the study of housing.

Besides the educational domain, various urban design and planning related organizations have developed experimental participatory urban design applications using Web 2.0-based social software and geospatial technologies. Examples of such initiatives are *"civic crowd"* sponsored by the British Design Council,"*Change by Us*" by the cities of New York and Philadelphia, *"Spacehive"* by multiple actors in London and *"Fix My Street", "Neighborland", "SeeClickFix"*and"*Openplans"*.

In 2010, we have conducted an eight-week long international urban DS 2.0 experiment (n=39) in which a geographic MediaWiki was used for the collaborative and location-based analysis of the project site (Pak and Verbeke, 2012). In this study, we looked for possible impacts of the introduced platform through web use statistics, feedback sessions and a comprehensive questionnaire. The most prominent finding was a strong correlation between online collaborative edits and student marks which weakens after a certain threshold (more than 240 edits in eight weeks). Although the number of participants was not statistically significant for generalization, this correlation suggested that the use of the platform may have increased students' progress to a certain extent (or vice versa); and depending on the profiles of the students, making edits more than a certain threshold may as well decrease their progress.

3. Testing the Design Studio 2.0 Concept: International Urban Design Studio 2012 in Luxembourg

During the Spring Semester of 2012 we (co-)organized an experimental design studio at the KU Leuven Faculty of Architecture, Campus Sint-Lucas

Brussels with the participation of 34 international students from eleven different European countries.

The design site covered the plateau of Kirchberg which was originally designed to accommodate one of the three official seats of the European Union; hosting various jurisdictional and financial institutions outside the historic city centre.

The students were divided in eight groups of four to five members. They were motivated to explore the inner city (especially the "eatscape") and use the results of their exploration as a source of inspiration. The aim was to understand what makes those ordinary eat-related amenities “the places” in the city and how the locals relate themselves to those places through their own human situations, events, meanings, and experiences. The results of this exploration through design ranged from urban furniture to large scale urban rethinking.

In order to facilitate this design studio and enhance the learning experience of the students, we have set up a new Social Geographic Web Platform in line with our DS 2.0 concept. This platform is significantly different than the one used in our previous experimental design studio (Pak and Verbeke, 2012). While the former was based on MediaWiki, the new one is based on an open-source content management framework incorporating several novel modules, libraries and in-house developed software (Figure 1). These were tested and improved during the past three years in real-life planning practices together with the participation of two urban planning focused non-governmental organizations operating in the Brussels Capital Region.

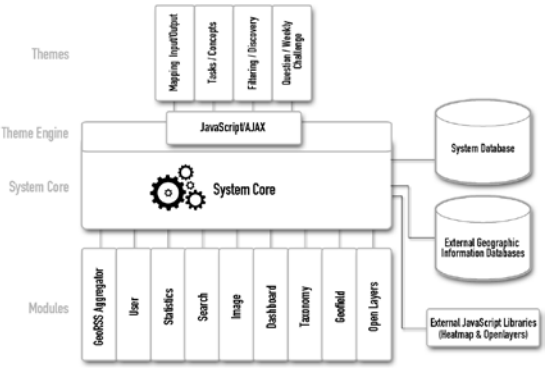

Figure 1. The architecture of the Social Geographic Web Platform

The students were provided with various functions including a collective mapping interface (for analysis and sharing), a personal dashboard, a filtering and discovery tool (which works in coordination with other interfaces),

image galleries, and a social discussion module which allows commenting and "liking" other students' works.

In order to motivate the students, we assigned weekly tasks using the platform and asked them to: create a map of their experiences, periodically upload their works and answer open-ended questions. Using the Social Geographic Web platform, the students mapped their own experiences and overlaid them with external geographic information, (i.e. maps from the GIS system of Luxembourg, Google Maps, Open StreetMap and Bing Maps).

This feature served the studio's aim of exploring the inner city of Luxembourg and using this as a source of inspiration. The teams were able to create collective interactive maps in groups and learned from each other. In this sense, the platform was used as an "external shared memory".

Figure 2. Above: The interface of the Social Geographic Web Platform (Below: Four layers of the collective group maps.

Since the design studio was physically located in Brussels, the design site was not immediately accessible by the students. Furthermore, a majority of

the students had no previous knowledge on Luxembourg. In this context, developing a design for this site was a geographically challenging task.

In order to overcome this challenge, through the web platform, we enabled the students to geographically locate photos, trace paths, associate them with maps and add individual comments. In addition, we contacted a planning expert from the city of Luxembourg and asked her to comment on the student works. In this way we wanted to make use of the expert knowledge constructed in real-life practices and incorporate it into the design studio.

Combining these possibilities with the affordances described above, our intention was to *enhance the observation power of students, create richer and authentic learning experiences in which the learners collaborate in creating new knowledge and extend their own understandings* (Lloyd, 2010).

4. Findings

We have employed a variety of methods to evaluate our DS 2.0 experiment and gather information on the nature and intensity of the students' online collaboration. Among these were the on-site web analytics, a student attitude survey, and feedback meetings. During the design studio the students shared 611 design drawings and images relating to their design process, organized in 952 posts. 15298 hits were logged onto the system which indicates the total number of pages requested from the server. In order to search for possible impacts of the platform on student learning, we have compared students' activities and grades. As a result, we have recorded an almost logarithmic pattern (Figure 3).

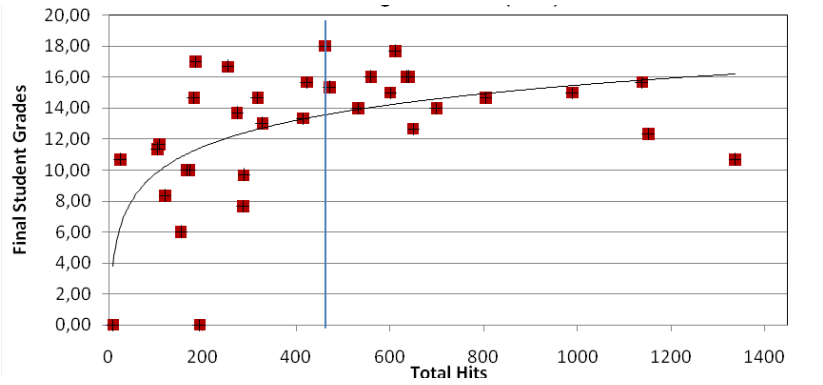

Figure 3. The comparison of online student activities with student grades as a learning indicator. Blue line: the mean number of hits per students.

Student progress tends to increase together with the online activity up to a certain point. After this point, it stays flat and slowly starts to decrease at the

end. This point is fairly close to the mean number of hits per person (the blue vertical line in Figure 3).

All failed (grades less than 10; 9 with tolerance) students' online activity was less than twenty percent of the highest amount of hits. This observation suggests that the students' activity in the introduced web platform may be positively related to their progress in the design studio; up to a certain limit. After this limit, this relationship starts to recede and produce negative effects.

In addition to the findings above, we received various responses during the feedback sessions and our online questionnaire, revealing some of the perceived potentials and benefits as well as challenges (Table 1).

Table 1. Examples from the student feedback collected via our online questionnaire.

S1. "It was a convenient way to handle the assignments and store your own files at the same time, much better than Toledo in any case."
S2. "Overall, the website was interesting and it was easy to create new posts, and it was nice to be able to see other people's works at any time, but at the same time, it is obvious that this kind of approach to teaching has to be done very carefully."
S3. "The accent should be in any case on the visual information... If the website is more interactive and visual, it will surely be more interesting for the students to spend more time in it..."
S4. "I still enjoy the old method of just delivering things physically to the teacher, especially because like that we do not need to think about a few problems that may come from the website, for example: if our internet crashes; the 404 Error and so on."
S.5 "My only complaint was that sometimes it took very long to submit our files into the website. I believe that that was the main reason why the website was not as helpful as it could be, for me. However, I think having a website like this is a great idea and could be very helpful in the development of our projects in design."
S6. "Nevertheless, such a way of uploading your work creates a very formal way of consultation."
S7. "It is important to improve the communication and most importantly its efficiency between students and experts /teachers/. The notion of private instant messages I think it is of big usage as well. The speed is not satisfactory."

Some of the students (i.e. S1) noted the superiority of the introduced platform when compared with the existing e-learning system of the school based on Blackboard (Toledo); which was not specifically tailored to be used in a design studio. Others addressed the benefits of being able to see other students' projects in a continuous manner (S2) but also the critical factors (S3 S4, S5, S6 and S7). According to the students, two biggest challenges were the complexity of the content that is produced by the students and the con-

nection speed. (S5) and (S7) complained about the time it took to upload large files.

(S3) referenced the high amount of textual information on the web platform as a barrier. He suggested that the platform to be more visual, stressing the importance of visual thinking in the discipline. (S4) expressed that he preferred delivering things physically to the teachers, without the need to think about the possible technical problems. It is clear that the accumulation of these issues can have a significant negative impact on participation.

In order to collect more feedback on the perceived affordances, we have asked several Likert-scale questions to the students. Three of these related to potentials of the web platform to contribute to learning from other students (Q1), the development of a better understanding of the project site (Q2) and learning from the external experts (Q3)(Table 3).

Table 3. Student reactions to the Likert scale questions in the questionnaire (n=22).

Using the Web Platform …	**Strongly Disagree**	**Mostly Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Mostly Agree**	**Strongly Agree**
(Q1) I learned from other students	0%	8%	5%	23%	50%	14%
(Q2) helped me to develop a better understanding of the project site	0%	12%	12%	26%	44%	6%
(Q3) I learned from external experts	18%	23%	18%	22%	10%	9%

The majority of the students (87%) strongly, mostly or somewhat agreed that they were able to learn from other students through the use of the web platform (Q1). Accordingly, 76% of the students responded positively to the question (Q2) relating to the potentials of the web platform to facilitate a better understanding of the project site.

The responses to the question on learning from the experts during the experimental design studios were surprising. As introduced in the previous section, an expert working for the city of Luxembourg commented on the student works during the studio. These were rather limited both in number (*n=14*). During the studio, there was a shared sense of dissatisfaction among

the students (Q3) due to the contents of these comments. 59% of the students strongly, mostly or somewhat disagreed that they were able to learn from the external experts.

This finding suggests that facilitating communication between students and experts does not necessarily support mutual learning. Learning is highly dependent on the profiles of the experts and their ability to express their opinions in a constructive manner.

5. Conclusion

In this paper, we revealed our observations relating to the nature of learning that took place in an experimental design studio. We received highly positive responses during the feedback sessions and in the online questionnaire. The students found the platform convenient and addressed it as a valuable resource for learning.

Reflecting on our own experiences, the web platform enabled us to extend the learning that took place in the design studio beyond the studio hours, to represent the design information in novel ways and allocate multiple communication forms. Through the introduced web platform, we were able to augment urban design learning, remediate and extend the reflective conversation in the design studio.

Using collaborative mapping functionality, the students collectively constructed a shared memory of urban spaces which reportedly helped them to develop a better understanding of their project site. They were able to learn from other students as well as the external experts.

Moreover, it was possible to combine conventional and online learning activities. By this way, the focus of the design studio was oriented more towards the students and the learning processes. The students commented on each other's works and constructed a common understanding (from a critical point of view: all of the comments were positive).

In addition to the above, through the analysis of the use logs, we found that the students' participation in the introduced web platform may be positively related to their progress up to a certain point. The relation is clear, but the direction of causality is still a question mark. This observation is in parallel with our former findings (Pak and Verbeke, 2012) in which a totally different web platform (MediaWiki) was employed.

For the future studies, we recommend to consider that over participation may be shifting the focus towards the online platform itself rather than the design process. Similar negative effects relating to the interface complexity were also observed during the experimental studios. During the studio, a significant amount of data gets accumulated on the web platform. Therefore, it

is necessary to carefully structure the large amount of text and visuals collected on the platform in a way that they can be inspiring and easily found when needed at the same time. Moreover, due to the limited size and resolution of the computer monitors, it is not easy to make side by side exhibitions like we do in real life; which we think that partially contributes to the difficulties in managing design information. There seems to be more space for development in this direction.

Furthermore, the individual differences between the students should be addressed carefully, since the impact of online learning on student progress can vary based on their backgrounds and computer literacy. We hope that our experiences from this study can provide clues on the design of similar learning environments and tools.

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